

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
26 September 2002 (26.09.2002)

PCT

(10) International Publication Number
WO 02/074631 A1

(51) International Patent Classification⁷: **B65B 67/12,**
B65D 33/00, 33/24

(74) Agents: **HELFGOTT, Samson et al.;** Rosenman & Colin
LLP, 575 Madison Avenue, New York, NY 10022-2585
(US).

(21) International Application Number: **PCT/US02/07956**

(22) International Filing Date: **14 March 2002 (14.03.2002)**

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:
60/276,162 15 March 2001 (15.03.2001) US
60/287,881 1 May 2001 (01.05.2001) US

(71) Applicant and

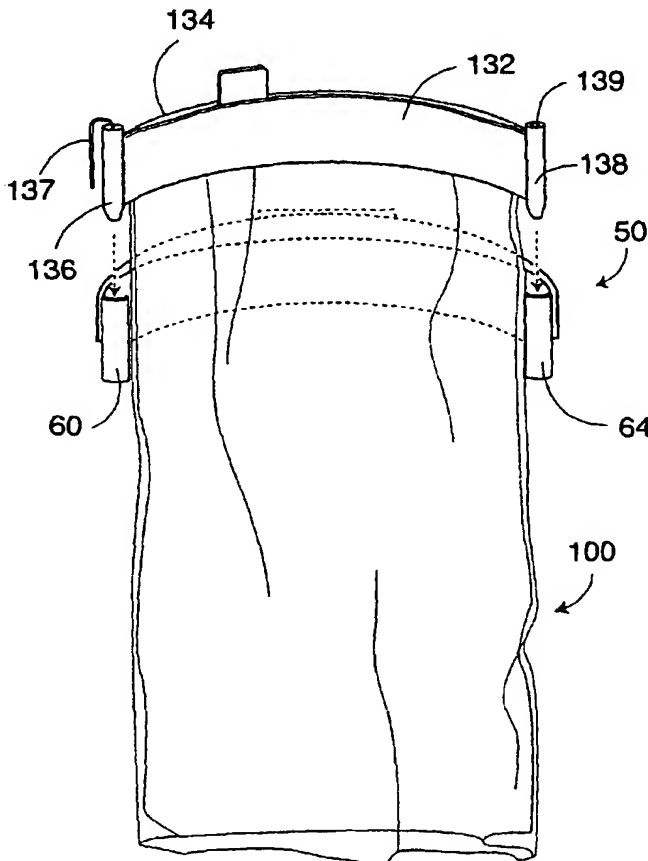
(72) Inventor: **PAPESKOV, Dragomir [US/US];** 180 Beach
117th Street, #1K, Rockaway Park, NY 11694 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG,
SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,
VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR,
GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent

[Continued on next page]

(54) Title: **DISPOSABLE GARBAGE BAG**



(57) Abstract: A disposable garbage bag (100) is provided with a resilient rim (130), formed from a pair of resilient strips (132, 134), having ends that are retainingly engageable such that one end of the rim may be secured adjacent the other end of the rim to maintain said bag with the rim in the closed position. A holder (50) is provided to temporarily retain the bag and force the rim of the bag to assume an arcuate configuration, such that the resilient strips that form the rim may be snapped apart and together while the bag is held by the support.

WO 02/074631 A1

WO 02/074631 A1



(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— with international search report

DISPOSABLE GARBAGE BAG

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority under 35 U.S.C. §119(e) from Provisional Application 60/276,162 filed on March 15, 2001 and Provisional Application
5 60/287,881 filed May 1, 2001.

FIELD OF THE INVENTION

This invention relates to disposable bags in general, and more particularly, to a disposable bag having a flexible rim that is capable of being sealed through the engagement of the rim ends, and that is capable of being snapped open and closed
10 while the bag is disposed in a holder.

BACKGROUND OF THE INVENTION

The positioning of garbage bags in tight places can sometimes be challenging. In automobiles, for example, garbage bags are usually attached to a gear shift or a window crank handle, or some other easily accessible location. Such "attachment"
15 usually involves the deformation or tying of a part of the bag around an object in the automobile, which can make it difficult to access the interior of the bag or remove the bag entirely from the vehicle prior to disposal. In airplanes, for example, and particularly in coach class, there really is no place to store garbage, and people often convert the seatback in front of them to a trash receptacle.

20 The positioning and supporting of garbage bags in small places can also be challenging. Garbage bags are usually vended as linings to plastic containers, which container maintains the top of the bag open and the interior of the bag accessible to trash and debris. The use of plastic containers as a means for locating and using garbage bags can be quite limiting, particularly if floor space is lacking.

In addition, there are times when a garbage bag would be convenient if located next to or affixed to a workstation without the use of a bulky plastic container. Thus, in a machine shop, for example, it might be convenient if a garbage bag could be located by or affixed to each piece of equipment, providing easy access to the
5 equipment user.

It is an object of the present invention to provide a disposable garbage bag system comprising a bag and a bag holder. The bag is provided with a resilient rim that is capable of being held open and capable of being snapped shut, and is further formed from a pair of resilient strips, having ends that are retainingly engageable such
10 that one end of the rim may be secured adjacent the other end of the rim to maintain said bag with the rim in the closed position. The bag is easily attached to and detachable from the holder, and once detached from the holder, is capable of being arranged into a closed orientation by virtue of the bag construction alone.

SUMMARY OF THE INVENTION

15 A disposable garbage bag is provided with a resilient rim, formed from a pair of resilient strips, having ends that are retainingly engageable such that one end of the rim may be secured adjacent the other end of the rim to maintain said bag with the rim in the closed position. A support is provided to temporarily retain the bag and force the rim of the bag to assume an arcuate configuration, such that the resilient strips that
20 form the rim may be snapped apart and together while the bag is held by the support.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates an embodiment of a bag holder of the present invention.

FIG. 2 illustrates an embodiment of a disposable garbage bag of the present invention.

FIG. 3 illustrates the engagement of the bag of FIG. 2 with the holder of FIG.

1.

FIG. 4 illustrates the bag of FIG. 2 engaged with the holder of FIG. 1.

FIG. 5 illustrates the bag of FIG. 4 in the open position.

5 FIG. 6 illustrates the bag of FIG. 5 filled with debris.

FIG. 7 illustrates the bag of FIG. 6 in the closed position.

FIG. 8 illustrates the attachment of the bag rim ends.

FIG. 9 illustrates the removal of the closed bag from the bag holder.

FIG. 10 illustrates the discarding of a closed bag into a larger waste receptacle
10 container.

FIG. 11 illustrates an alternative embodiment of a bag of the invention.

FIG. 12 illustrates the closure of the bag of FIG. 11.

FIG. 13 illustrates a further alternative embodiment of a holder of the
invention.

15 FIG. 14 illustrates a further alternative embodiment of a bag of the invention.

FIG. 15 illustrates the engagement of the bag of FIG. 14 with the holder of
FIG. 13.

FIG. 16 illustrates the closure of the bag of FIG. 14.

FIGS. 17-22 illustrate alternative embodiments of bag holder mounting means
20 of the present invention.

FIG. 23 illustrates a further alternative embodiment of a bag and holder of the
invention.

FIG. 24 illustrates a further alternative embodiment of a bag of the invention.

FIGS. 25-26 illustrate the closure of the bag of FIG. 24.

25 FIG. 27 illustrates a further alternative embodiment of a bag of the invention.

FIG. 28 illustrate a further alternative embodiment of the holder of the present invention.

FIGS. 29-30 illustrate a further alternative embodiment of the holder of the invention having a sloping support surface.

5

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The following detailed description is of the best mode or modes of the invention presently contemplated. Such description is not intended to be understood in a limiting sense, but to be an example of the invention presented solely for illustration thereof, and by reference to which in connection with the following description and the accompanying drawings one skilled in the art may be advised of the advantages and construction of the invention. In the various views of the drawings, like reference characters designate like or similar parts.

FIGS. 1-10 illustrate a first embodiment of a disposable garbage bag system of the present invention. A collection bag 100 (FIG. 2), having an interior 110 and a sealed bottom 120, is provided with a rim 130 defined by a pair of resilient strips 132, 134, a gripping tab 135 disposed on one of said strips 132, and a pair of end members 136, 138 disposed at opposite ends of said rim 130. One of the end members 136 is further provided with a hook member 137 that is adapted to engage an opening 139 provided in the other end member 138 as will be described below.

The bag 100 is adapted to engage with a holder 50 (FIG. 1) having a support surface 54, a mounting surface 58 and a pair of receiving chambers 60 and 64. As will be described below, the mounting surface 58 may be adapted to mount to a variety of objects such as a planar wall surface or the like. The chambers 60, 64 are dimensioned to slidably receive the rim end members 136, 138 (FIG. 3) until the bag

100 is securely retained in the holder 50 (FIG. 4). Once the bag 100 is attached to the holder 50, the bag rim 130 may be opened (FIG. 5) to receive debris 900 and the like (FIG. 6). More specifically, because the rim strips 132, 134 are held against the holder's arcuate support surface 54 such that the rim strips 132, 134 assume an arcuate configuration (FIG. 4), and because the rim strips 132, 134 are preferably formed from a flexible, plastic material, the rim 130 is capable of being "snapped" open (FIG. 5) so that the rim strip 132 is separable from the other rim strip 134. In operation, a user would grasp the tab 135 and pull the rim strip 132 apart from the other rim strip 134 to gain access to the interior 110 of the bag 100. While the use of a grip tab is discussed in connection with the operation of the bag of the invention, other means of opening and closing the bag, including the use of no grip tab at all, are contemplated.

After filling the bag 100 with debris 900, the user may close the bag rim 130 by merely pushing on the rim strip 132 until the rim strip 132 snaps back against the other rim strip 134 (FIG. 7). It is desirable to keep the bag 100 closed during periods of non-use to prevent debris odors and the like from escaping and becoming a nuisance. Thus, the opening and closing of the bag rim 130 is simple to accomplish, and may be repeated a number of times until it is desired to discard and/or replace the bag 100.

Removal of the bag 100 from the holder 50 may be accomplished by first removing the rim end 136 from the receiving chamber 60 and folding the bag rim 130 effectively in half (FIG. 8). Then, the hook 137 is inserted into the opening 139 located in the other rim end 138 to keep the rim 130 and the rim strips 132, 134 in a tightly closed position. Finally, the remaining rim end 138 is removed from the receiving chamber 64 (FIG. 9), thereby completing the separation of the bag 100 from

the holder 50, so that the bag 100 can be discarded into a larger waste container 950 (FIG. 10) with the bag rim held in the closed position. It will be appreciated that while the bag 100 can be closed as shown in FIG. 8 and then removed from the holder 50 as shown in FIG. 9, the bag 100 can also be completely removed from the holder 50, through the disengagement of both rim ends 136, 138 from both receiving chambers 60, 64, before the bag is closed as shown in FIG. 8.

The bag 100 and rim 130 are preferably formed from plastic, flexible material, although other materials are contemplated. For instance, the bag 100 may be formed from paper if desired. The bag rim 130 is preferably formed from a resilient material so that it can conform to an arcuate configuration (i.e., by virtue of the bag holder support surface) and so that it can be snapped open and shut as described above. Similarly, a resilient material will assist in maintaining the closure of the bag rim once the bag is closed prior to being discarded. The rim ends that engage the receiving chambers in the bag holder are preferably formed from a rigid material. The same applies to the bag holder, which should also preferably be rigid.

FIGS. 11-12 illustrate an alternative embodiment of the present invention, whereby a bag 200 is provided with a rim 230 defined by a pair of rim strips 232, 234 and rim ends 236, 238 and a grip tab 235, which bag 200 is generally similar to the bag 100 of FIGS. 1-10. With the bag 200, however, one of the rim strips 232 is provided with a receiving chamber 233 adjacent one of the rim ends 238, which chamber 233 is adapted to receive the other of the rim ends 236 during the final closing and discarding of the bag 200 (FIG. 12). The engagement of the rim end 236 with the receiving chamber 233 maintains the rim strips 232, 234 in a tightly closed arrangement to prevent debris odor and the like from escaping the bag interior 210. This differs from the engagement of the hook 137 and opening 139 illustrated in the

embodiment of FIGS. 1-10, which hook 137 and opening 139 cooperate to maintain the bag 100 closed during the removal from the holder 50.

FIGS. 13-16 illustrate yet another embodiment of a bag 300 (FIG. 14) and holder 350 (FIG. 13) of the present invention, whereby a bag 300 is provided with a rim 330 having rim strips 332, 334, a grip tab 335 and rim ends 336, 338. Each rim end is provided with protruding members 340, 341 that are adapted for insertion into receiving chambers 360, 364 provided on the holder 350 (FIG. 15). In addition, the first rim end 336 is provided with pins 370 that are engageable with openings 372 provided in the other rim end 338 to effect a closure of the bag rim 330 (FIG. 16) prior to discard of the bag 300. Thus, as described above and below, a variety of bag closure means are contemplated.

FIGS. 17-23 illustrate a variety of mounting embodiments for mounting the holder of the invention to a support surface or structure. The holder 50 of FIGS. 1-10 is illustrated for purposes of explanation, although it will be understood that any holder embodiment of the invention may be used.

FIG. 17 illustrates a mounting member 400 in the shape of a cup, which cup is then adapted to fit within an automobile cup holder 405. Thus, the holder of FIG. 17 can be used in an automobile by insertion into the automobile's pre-existing cup holder support 405. Thus, the holder 50 can be used with and removed from an automobile without any type of permanent fixation.

FIG. 18 illustrates a mounting member 410 in the form of a suction cup, which can then be applied to a piece of glass (not shown) or the like. In a car, such piece of glass might be a door window. In a taxi, for example, such piece of glass might be a divider that extends between the front and back seats and that separates the driver

from the passengers. In a machine shop, the suction cup mounting member 410 might be any planar surface that will support the attachment of a suction mount.

FIG. 19 illustrates a mounting member 415 in the form of a "C"-shaped bracket. Such mounting member 415 might be used, for example, in an office
5 environment whereby the mounting member 415 may be applied to the top of a cubicle divider.

FIG. 20 illustrates a mounting member 420 particularly suited for attachment to an automobile stick shift 425, while FIG. 21 illustrates a mounting member 430 particularly suited for attachment to an automobile headrest 435. FIG. 22 illustrates a
10 mounting member 440 that is fixable to a mounting surface (not shown) via fasteners 445 or the like. Clearly, the bag holder of the present invention can be mounted using a variety of removable, semi-permanent (e.g., double-sided tape or the like) and permanent means.

FIG. 23 illustrates yet another embodiment of a bag 500 and holder 550,
15 wherein the holder 550 has a cup-shaped mounting means 558 and an inner support surface 554 lined with outwardly protruding members 555. The protruding members 555 engage the openings 535 provided in the rim strips 532, 534 to assist in the connection between the bag 500 and holder 550 when the rim ends 536, 538 are engaged in the holder receiving chambers 560, 564.

20 FIGS. 24-26 illustrate a further alternative embodiment of a bag 600 and holder 650, whereby a rim end 636 is provided with a downwardly protruding member 637 that is adapted for insertion into an opening 639 provided on the other rim end member 638. FIG. 27 illustrates a further embodiment of a bag 700 of the invention having an upwardly protruding member 737 provided on a rim end 736 that
25 is adapted for insertion into an opening 739 provided on the other rim end 738. The

protruding members 637, 737 may be dimensioned and configured so that such members may be removed from the openings 639, 739 if desired. Alternatively, such members 637, 737 may be configured to be irremovable from said openings 639, 739 after the initial engagement between the two.

5 FIGS. 28-30 illustrate various alternative holder embodiments of the present invention. FIG. 28 illustrates a holder 800 having a plurality of receiving chambers 802, 804 adapted to receive downwardly extending bag rim ends (e.g., rim ends 136, 138 of FIGS. 1-10), and a plurality of receiving chambers 806, 808 adapted to receive
10 sideways extending bag rim ends (e.g., rim ends 340, 341 of FIGS. 13-16). Thus, the holder 800 of FIG. 28 may be used with a variety of bags having a variety of rim end configurations.

 FIGS. 29-30 illustrate a bag holder 850 similar in configuration to that of holder 800 of FIG. 28, but with a support surface 855 that is sloped from the vertical by an angle 860. The sloped support surface 855 assists in supporting a garbage bag
15 that is full of debris, since the slope tends to sustain the downwardly extending forces exerted by a debris-laden bag.

 While the present invention has been described at some length and with some particularity with respect to the several described embodiments, it is not intended that it should be limited to any such particulars or embodiments or any particular
20 embodiment, but it is to be construed with references to the appended claims so as to provide the broadest possible interpretation of such claims in view of the prior art and, therefore, to effectively encompass the intended scope of the invention.

CLAIMS

I claim:

1. A disposable garbage bag comprising:
 - a) a flexible container having an interior portion, a sealed bottom portion and an unsealed top portion,
 - b) a rim provided on said top portion of said container, said rim having a first end and a second end and a pair of resilient strips disposed therebetween, and
 - c) means for securely retaining said first end of said rim adjacent said second end such that said resilient strips are maintained in an abutting relationship and access to said interior portion of said flexible container is prevented.
2. A disposable garbage bag in accordance with claim 1, wherein said retaining means further comprises an opening incorporated into one end of said rim and a protrusion incorporated into the other end of said rim, said protrusion dimensioned to engage said opening.
3. A disposable garbage bag in accordance with claim 2, wherein said protrusion further comprises a hook extending outwardly from said other end of said rim.
4. A disposable garbage bag in accordance with claim 2, wherein said protrusion further comprises an extension of said other end of said rim, said extension having a recess, said recess of said extension adapted for snap engagement of said extension with said opening.
5. A disposable garbage bag in accordance with claim 4, wherein said extension is dimensioned to lock into said opening.

6. A disposable garbage bag in accordance with claim 1, wherein said retaining means further comprises a chamber formed on one of said resilient strips adjacent one end of said rim, said chamber dimensioned to receive said other end of said rim therein.

7. A disposable garbage bag in accordance with claim 2, further comprising a handle provided on one of said resilient strips.

8. A disposable garbage bag in accordance with claim 1, further comprising:

- a) a bag holder having receiving chambers for temporarily receiving said rim ends of said bag,
- b) said bag holder adapted to maintain said resilient strips in an arcuate, abutting position, such that one of said resilient strips may be initially outwardly displaced from the other strip to provide access to said interior of said container, and then subsequently snapped back against said strip to prevent access to said interior of said container,
- c) said strip being held in an outwardly displaced position by said engagement of said bag and said bag holder that forces said bag rim to assume an arcuate configuration.

9. A disposable garbage bag assembly comprising:

- a) a flexible container having an interior portion, a sealed bottom portion and an unsealed top portion,
- b) a rim provided on said top portion of said container, said rim having a first end and a second end and a pair of resilient strips disposed therebetween,
- c) means for securely retaining said first end of said rim adjacent said second end such that said resilient strips are maintained in an abutting

relationship and access to said interior portion of said flexible container is prevented, and

- d) a support for temporarily holding said flexible container.

10. A disposable garbage bag assembly in accordance with claim 9, wherein said support further comprises:

- a) a first receiving end adapted to receive said first end of said rim,
- b) a second receiving end adapted to receive said second end of said rim, and
- c) a backing disposed between said receiving ends,
- d) wherein said receiving ends are spaced apart so that said resilient strips are maintained in an arcuate, abutting position, such that one of said resilient strips is positioned adjacent said backing, and said other resilient strip may be initially outwardly displaced from said one of said resilient strips to provide access to said interior of said container, and then subsequently snapped back against said one of said resilient strips to prevent access to said interior of said container,
- e) said other resilient strip being held in an outwardly displaced position by said engagement of said bag and said support that forces said bag rim to assume an arcuate configuration.

11. A disposable garbage bag assembly in accordance with claim 9, wherein said retaining means further comprises an opening incorporated into one end of said rim and a protrusion incorporated into the other end of said rim, said protrusion dimensioned to engage said opening.

12. A disposable garbage bag assembly in accordance with claim 11, wherein said protrusion further comprises a hook extending outwardly from said other end of said rim.

13. A disposable garbage bag assembly in accordance with claim 11, wherein said protrusion further comprises an extension of said other end of said rim, said extension having a recess, said recess of said extension adapted for snap engagement of said extension with said opening.

14. A disposable garbage bag assembly in accordance with claim 9, wherein said retaining means further comprises a chamber formed on one of said resilient strips adjacent one end of said rim, said chamber dimensioned to receive said other end of said rim therein.

15. A disposable garbage bag assembly in accordance with claim 10, wherein said ends of said container rim and said receiving ends of said support are tubular.

16. A disposable garbage bag assembly in accordance with claim 15, wherein at least one end of said container rim further comprises a plurality of protrusions adapted to be received by a plurality of recesses provided on at least one receiving end of said support.

17. A disposable garbage bag assembly in accordance with claim 10, wherein at least one receiving end of said support is provided with at least two entries of differing angular orientations.

18. A disposable garbage bag assembly in accordance with claim 10, wherein said backing is cross-sectionally sloped.

19. A disposable garbage bag assembly in accordance with claim 9, further comprising means for mounting said support to an alternative support structure.

20. A disposable garbage bag assembly in accordance with claim 9, wherein said support is integrally formed in an alternative support structure.

1 / 24

FIG. 1

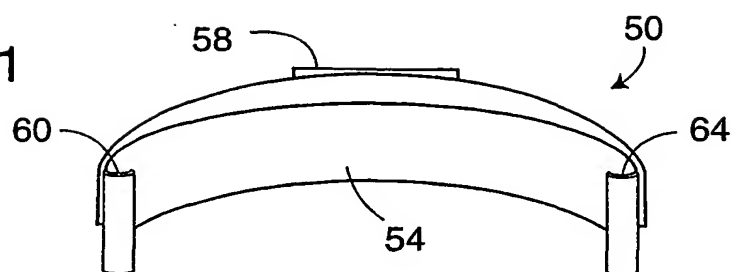
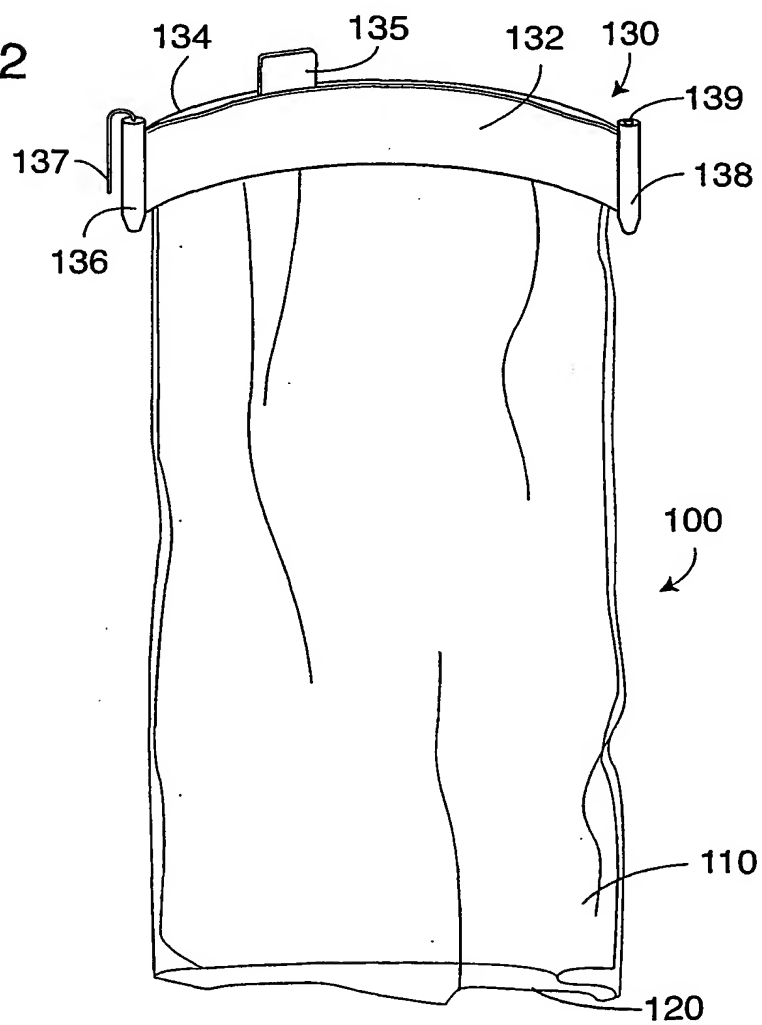
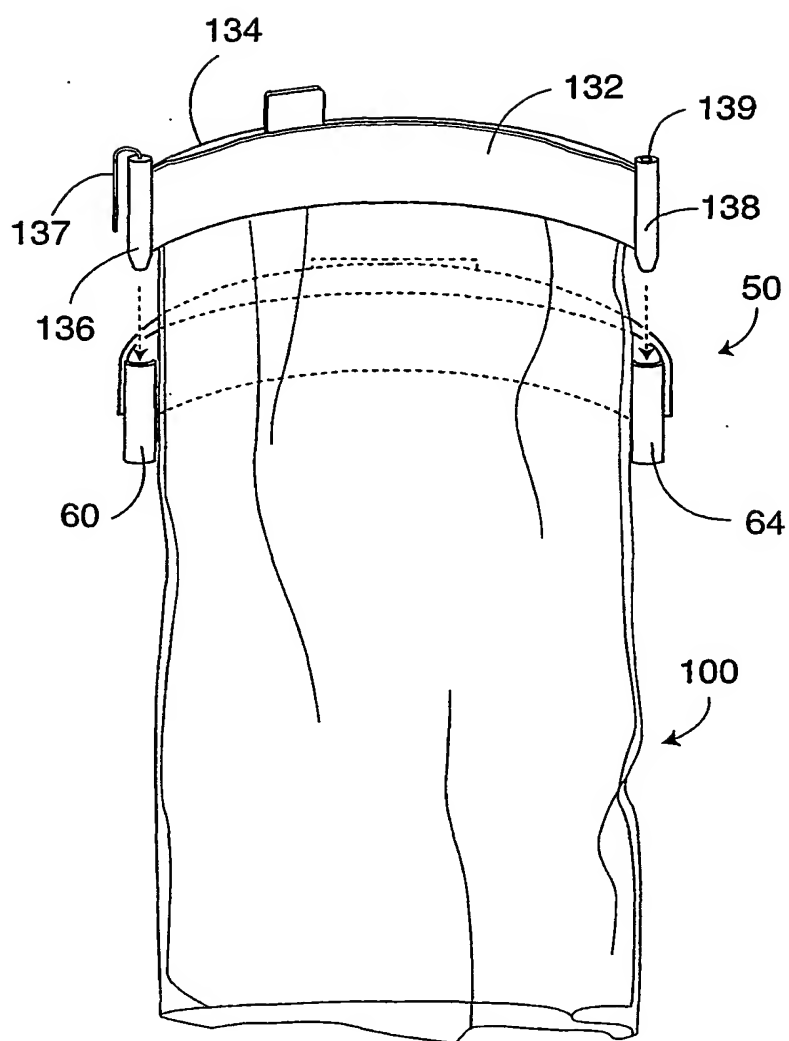


FIG. 2



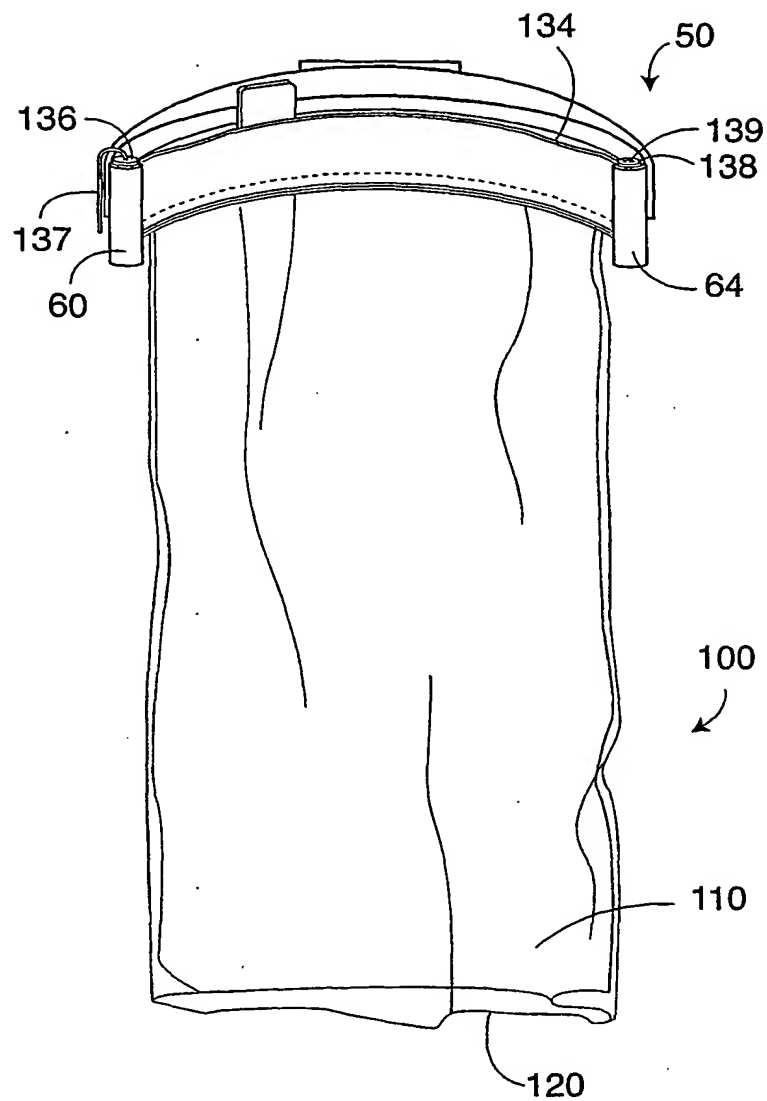
2 / 24

FIG. 3



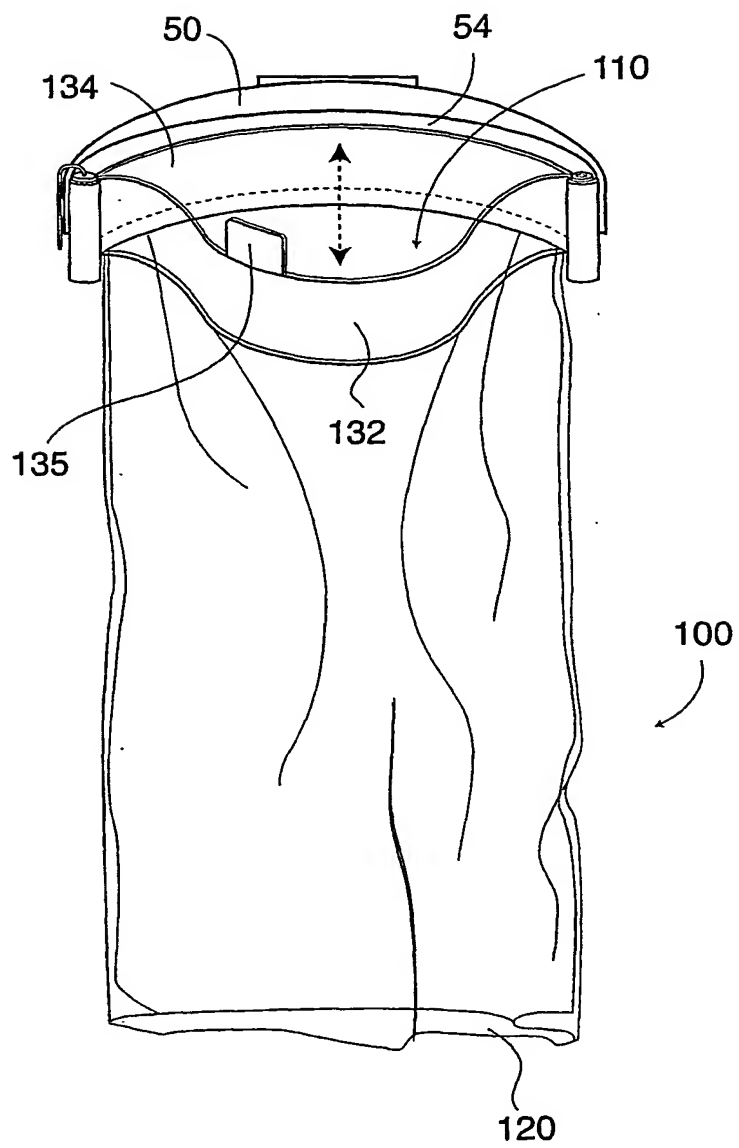
3 / 24

FIG. 4



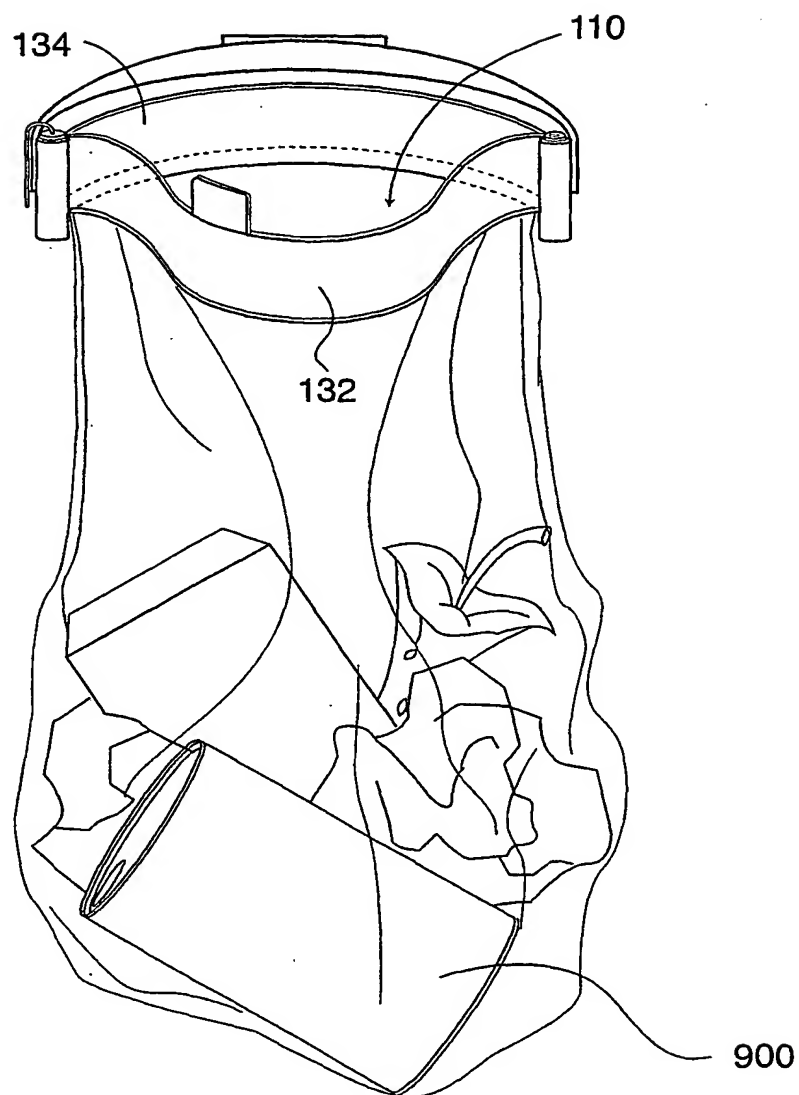
4 / 24

FIG. 5



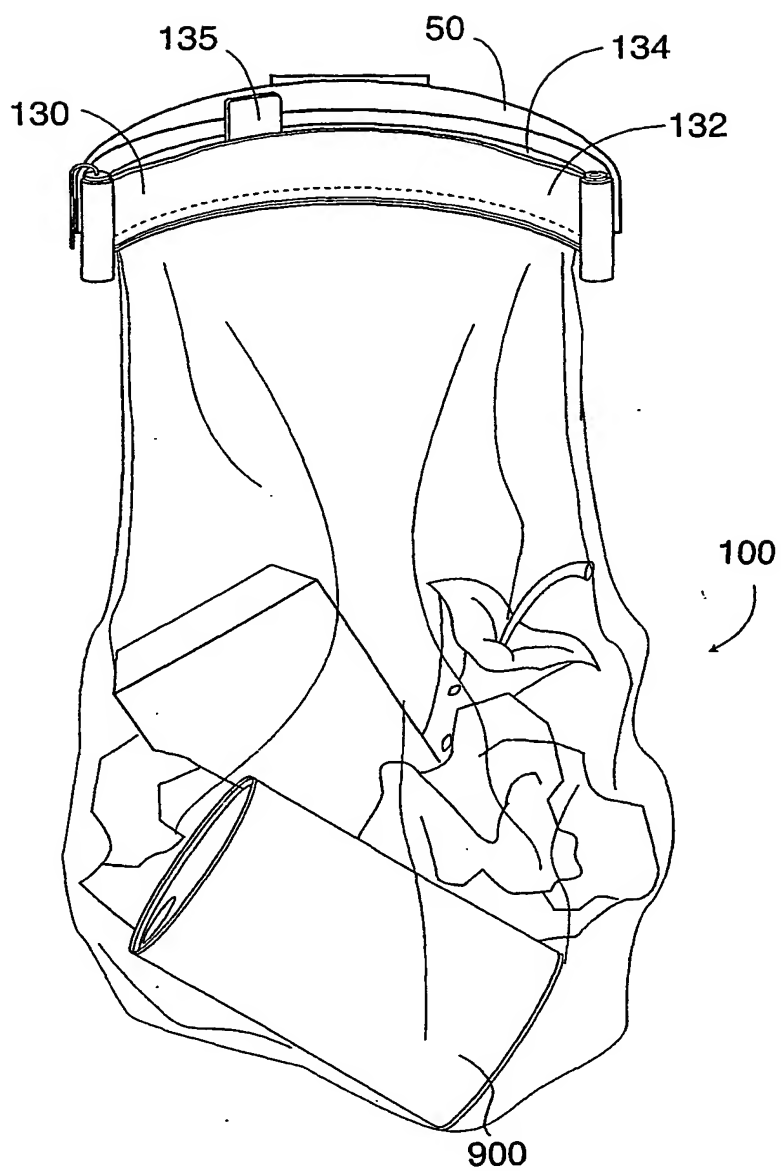
5 / 24

FIG. 6



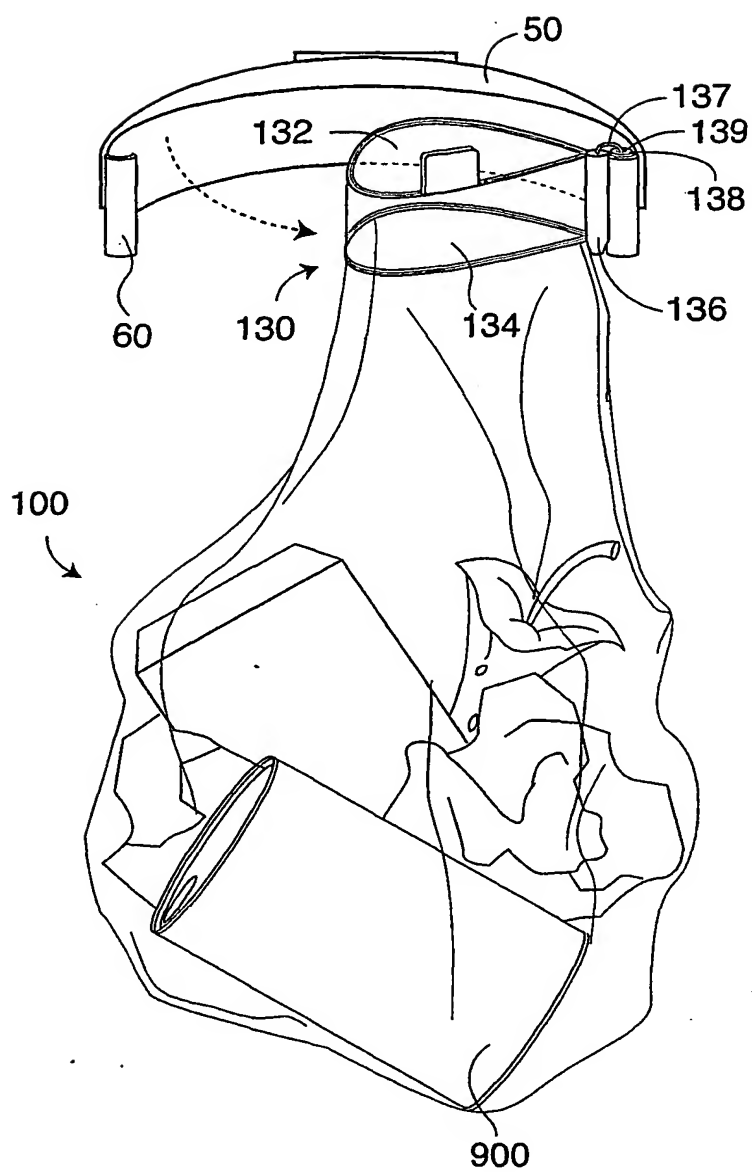
6 / 24

FIG. 7



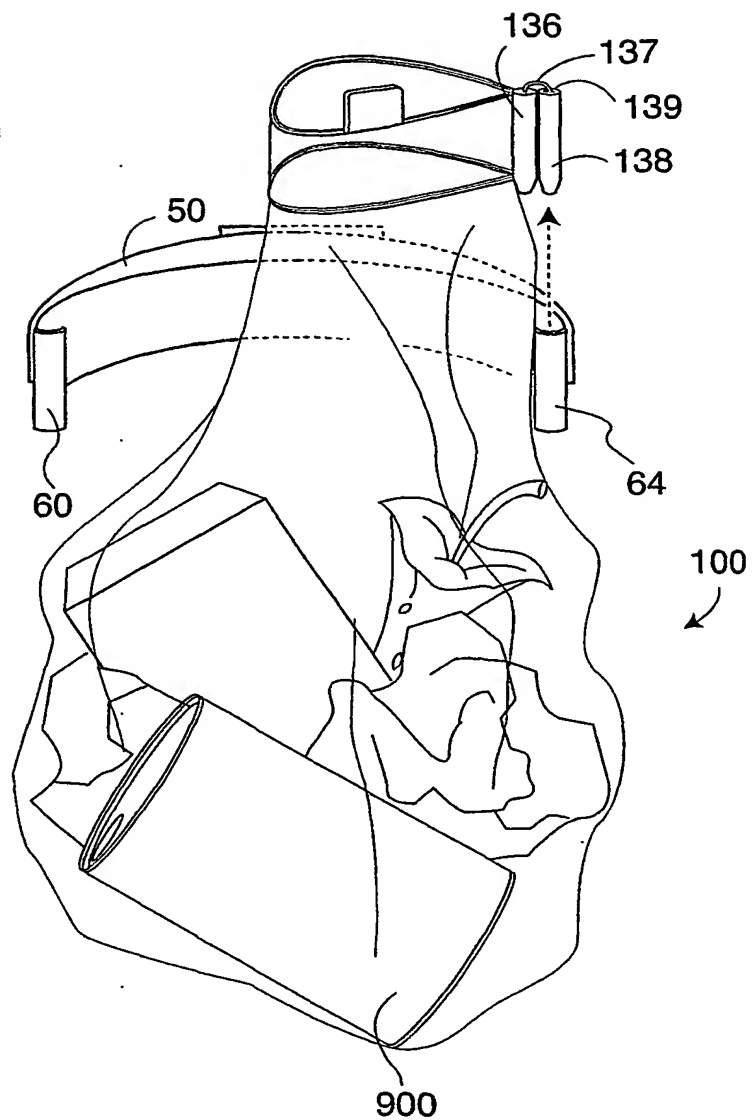
7 / 24

FIG. 8



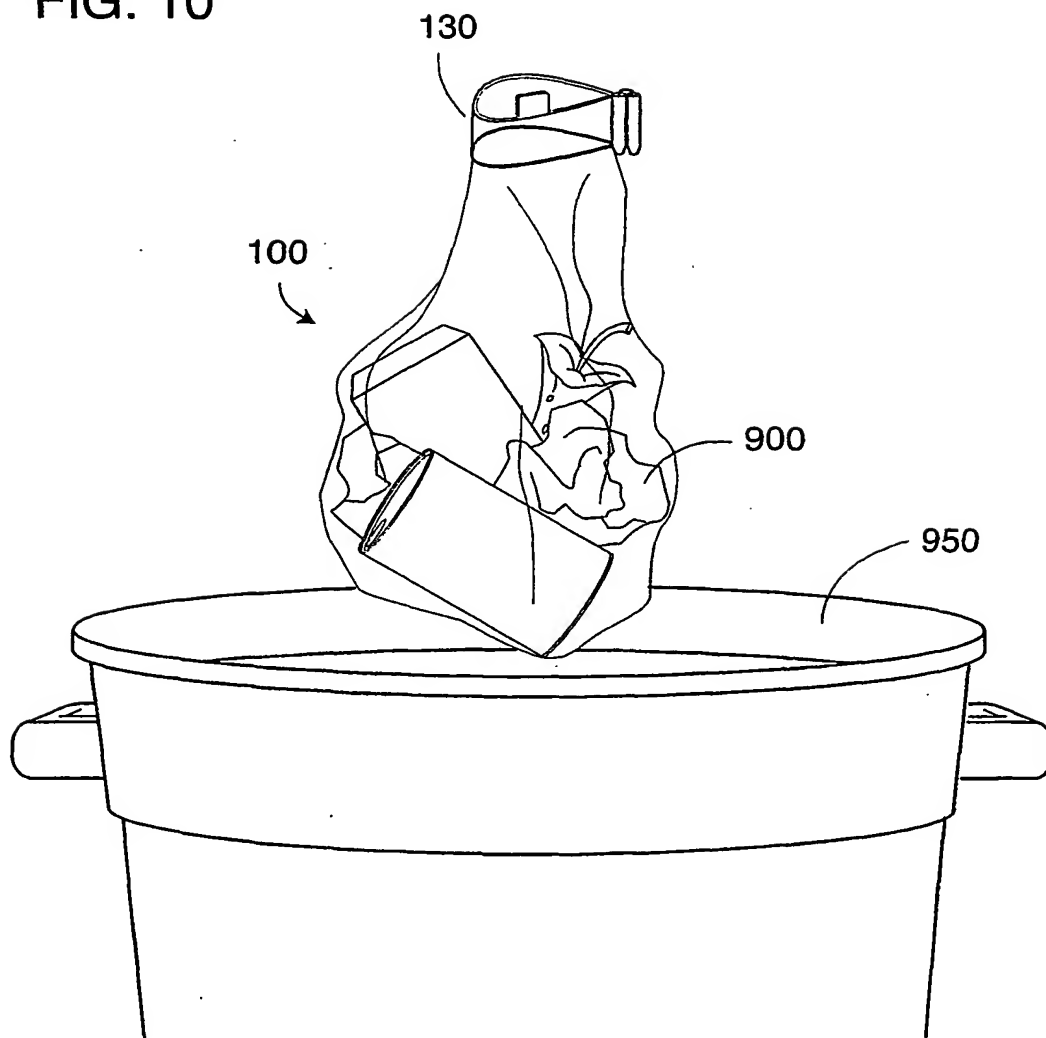
8 / 24

FIG. 9



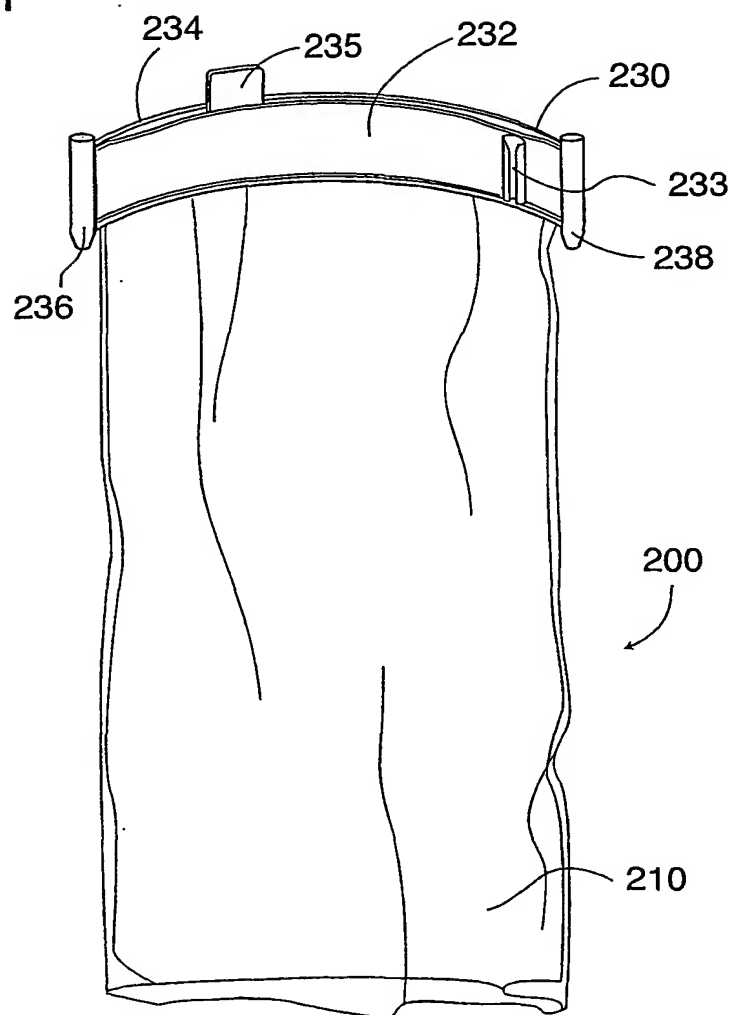
9 / 24

FIG. 10



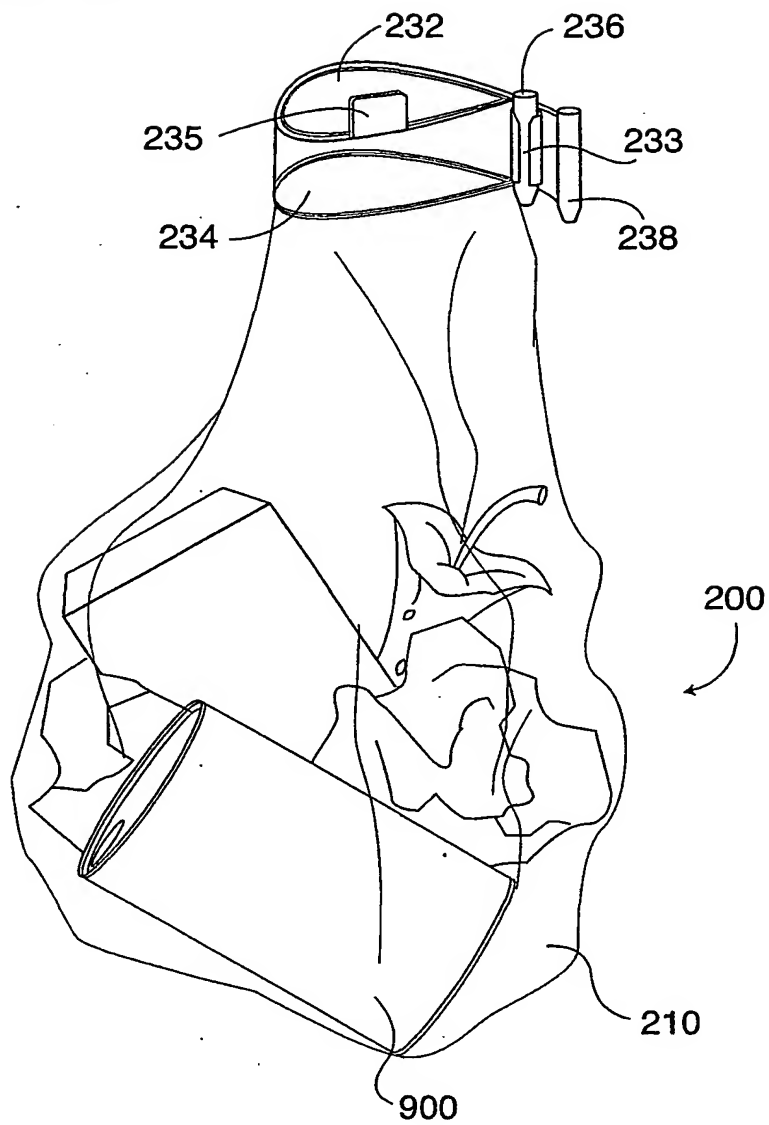
10 / 24

FIG. 11



11 / 24

FIG. 12



12 / 24

FIG. 13

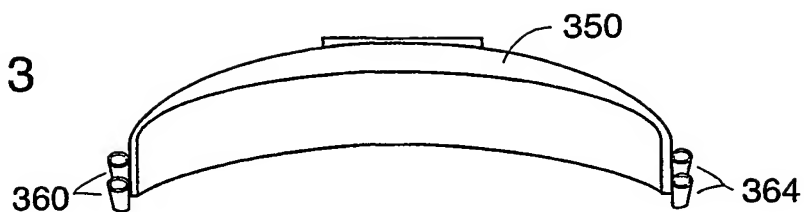
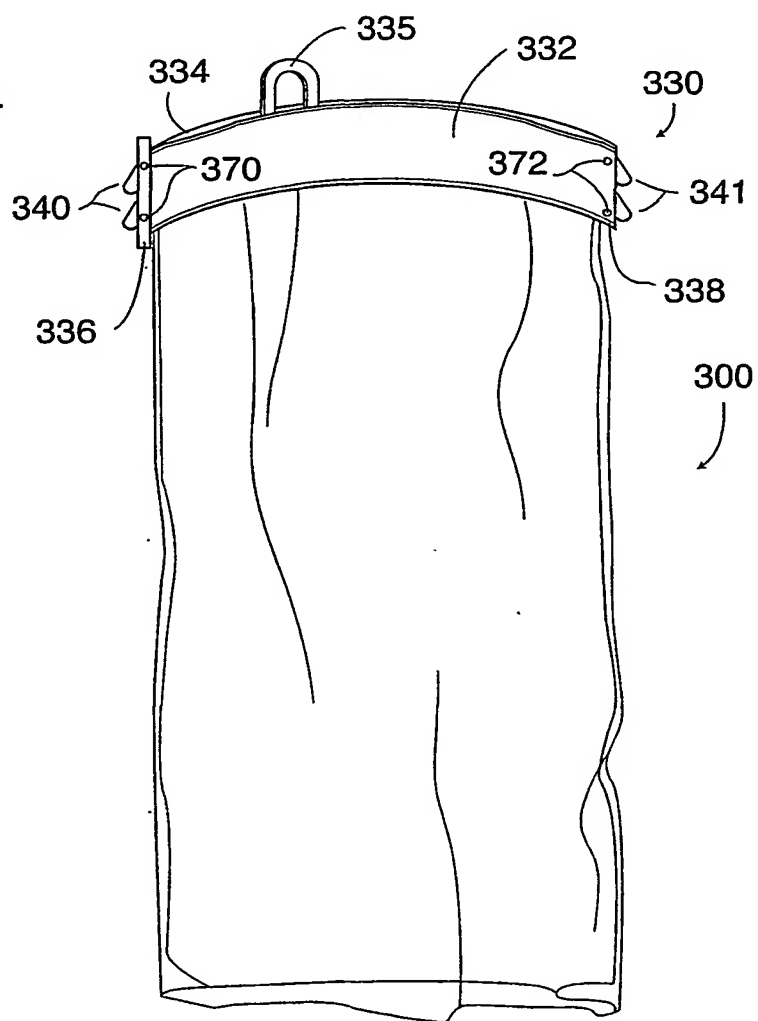
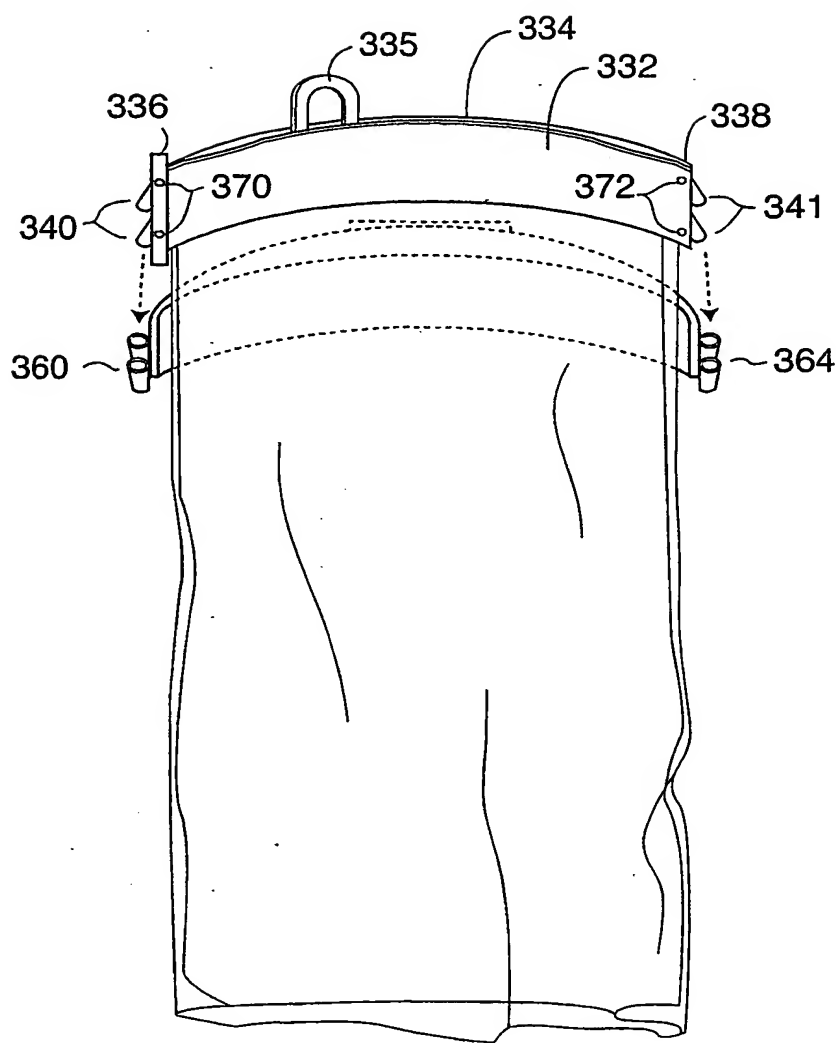


FIG. 14



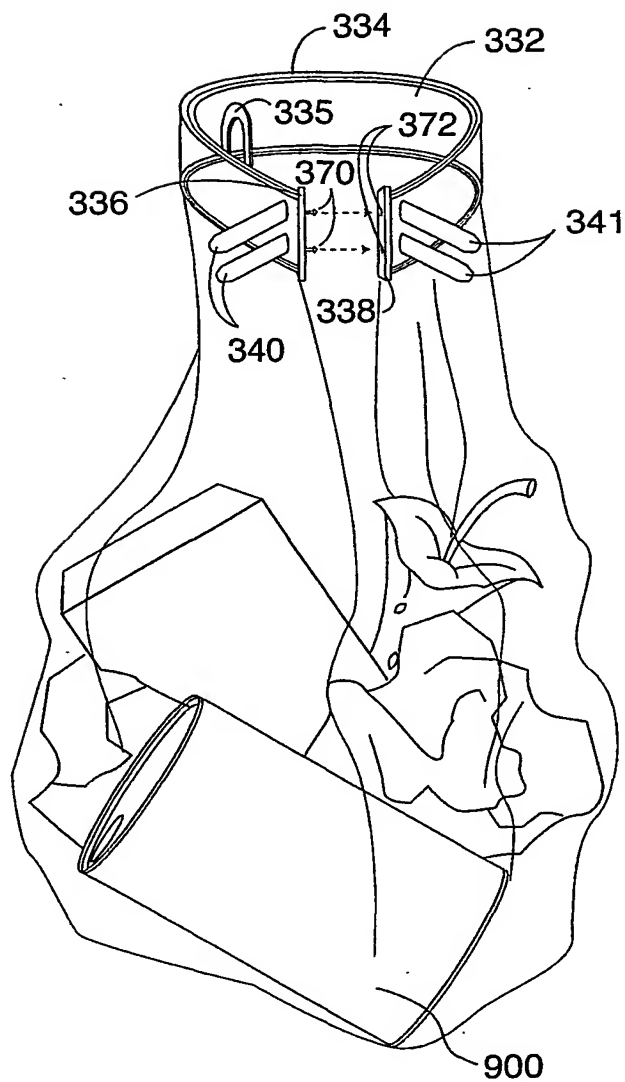
13 / 24

FIG. 15



14 / 24

FIG. 16



15 / 24

FIG.17

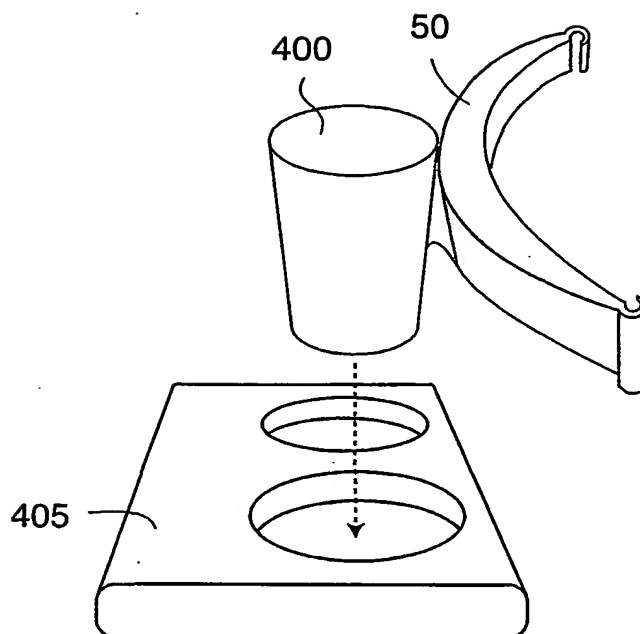
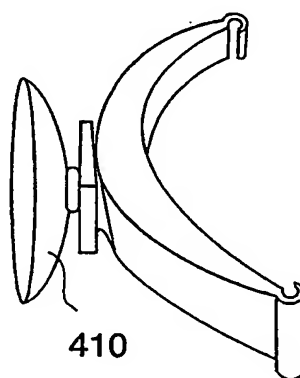


FIG.18



16 / 24

FIG.19

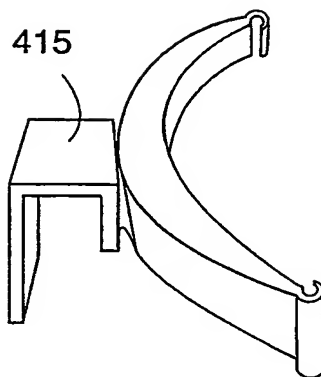
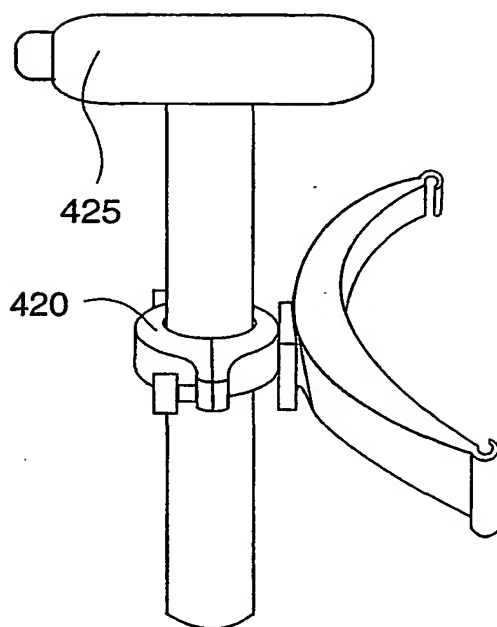


FIG.20



17 / 24

FIG. 21

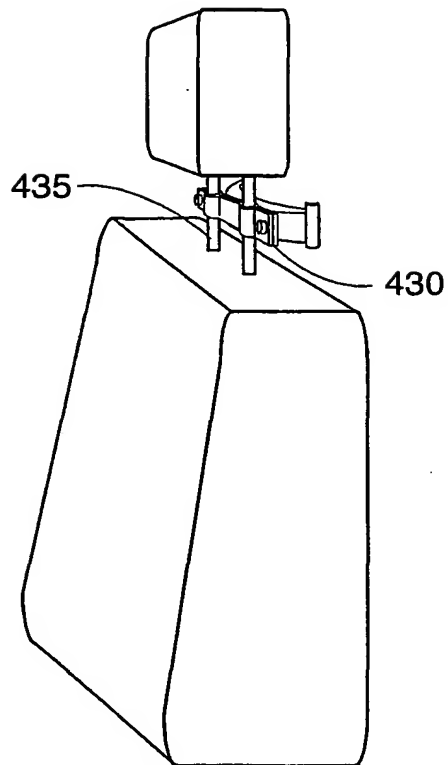


FIG. 22

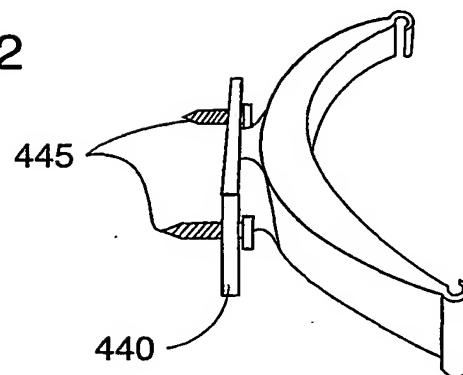
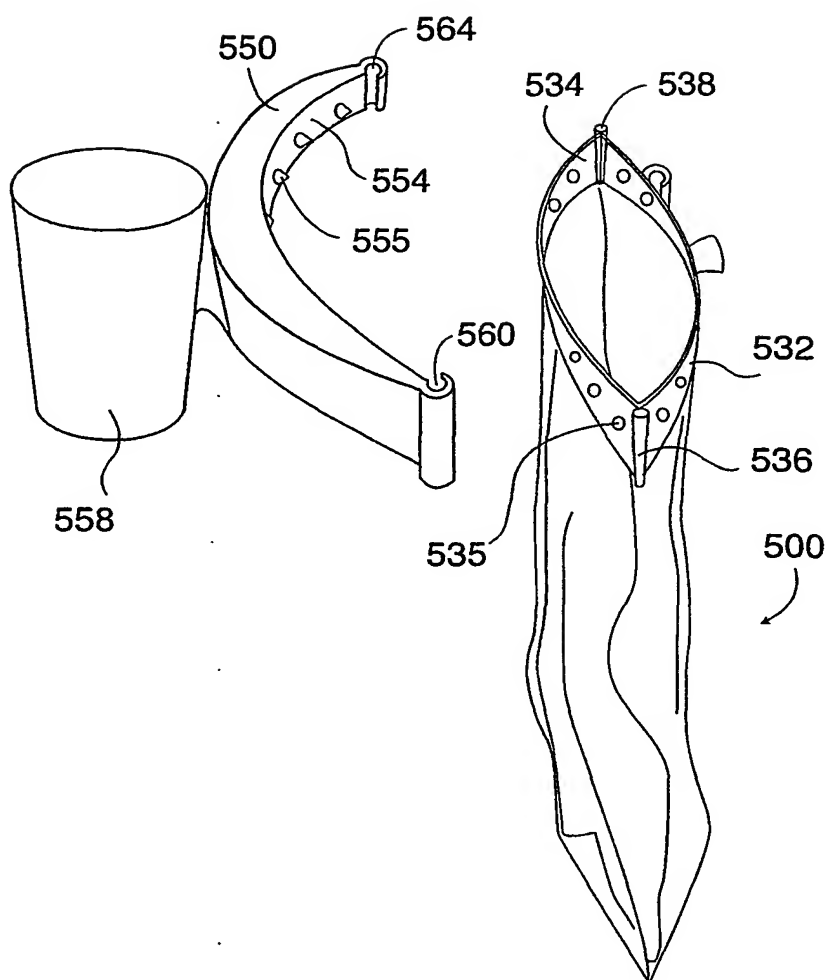
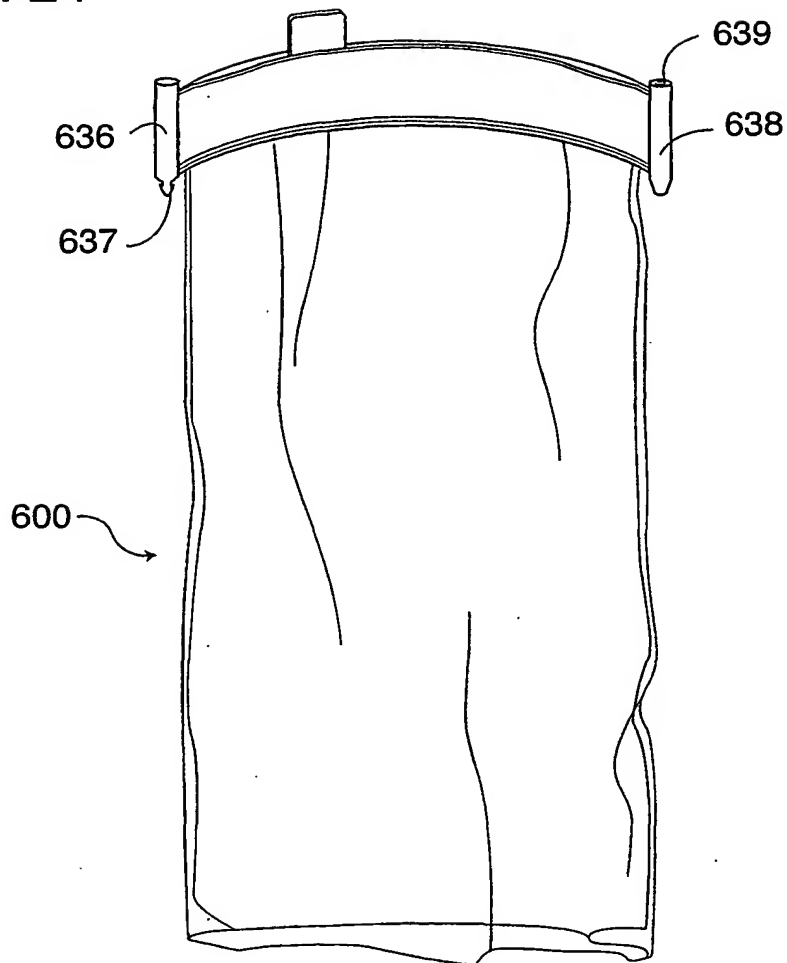


FIG. 23



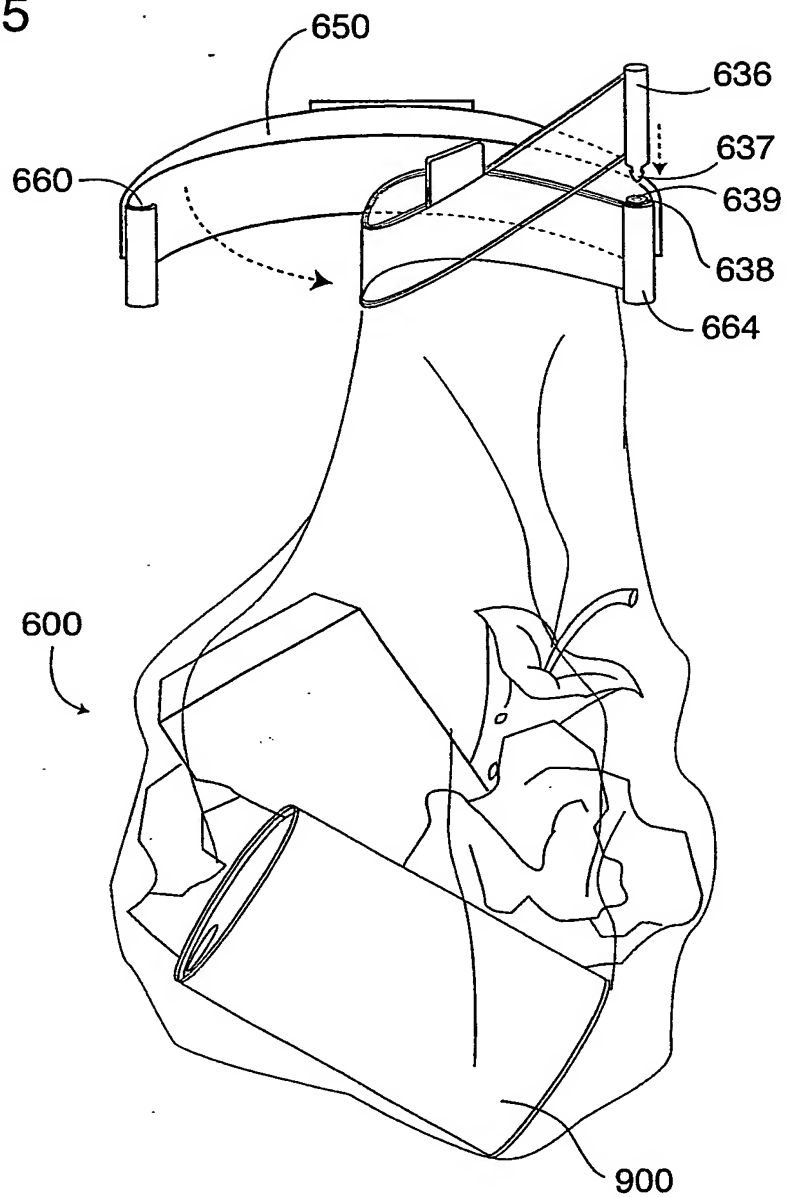
19 / 24

FIG. 24



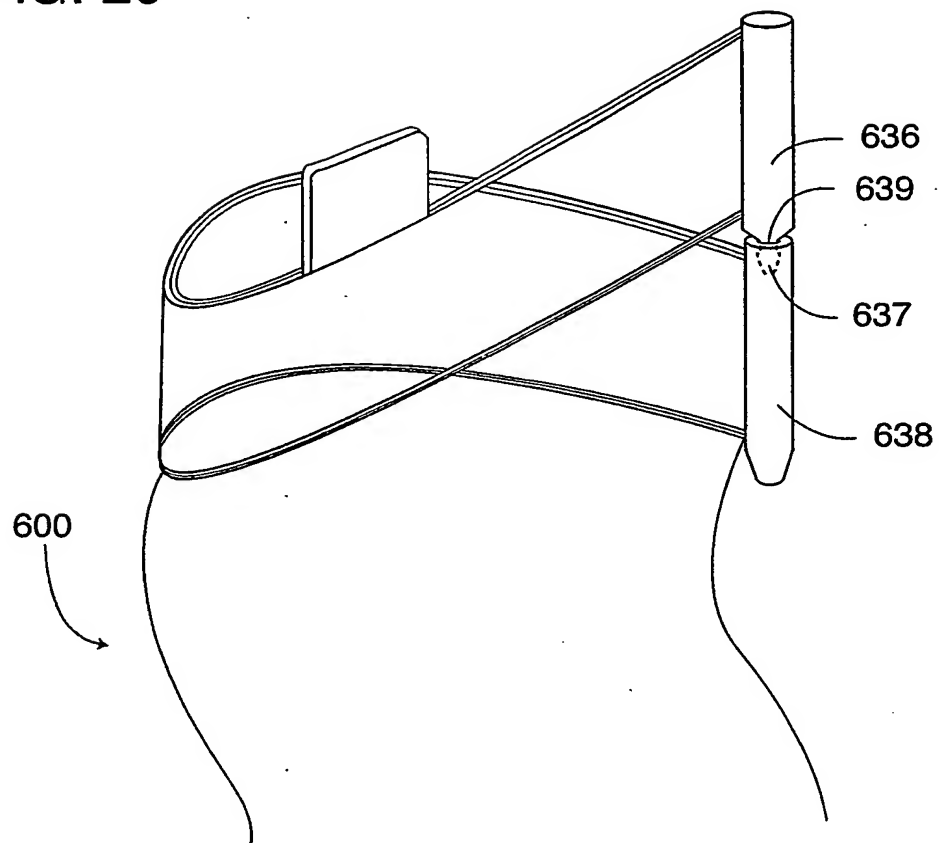
20 / 24

FIG. 25



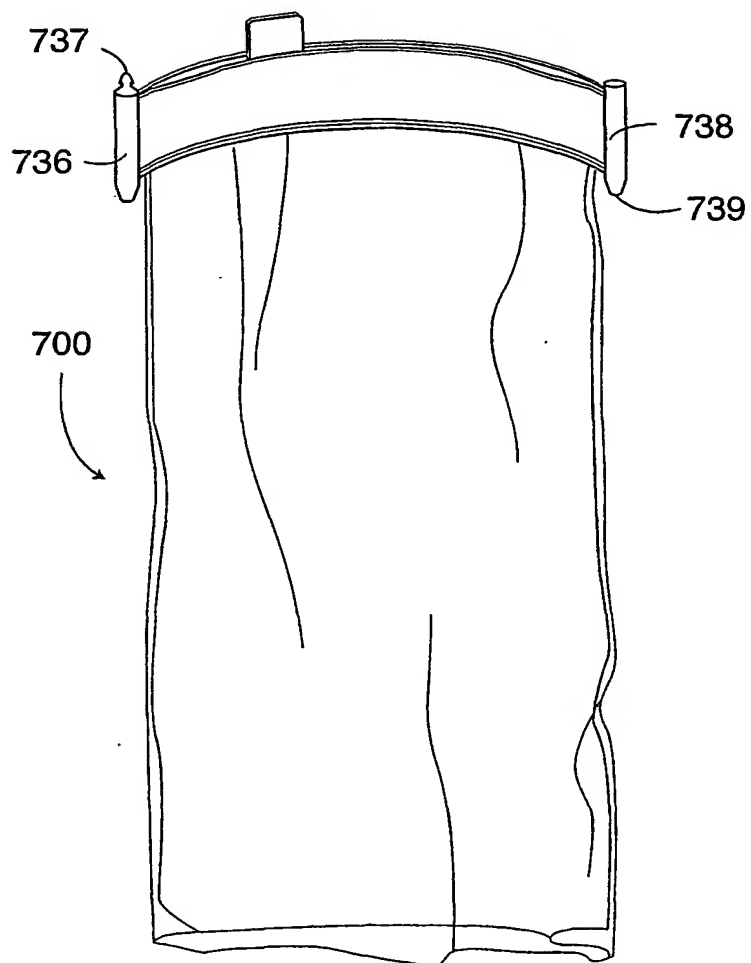
21 / 24

FIG. 26



22 / 24

FIG. 27



23 / 24

FIG. 28

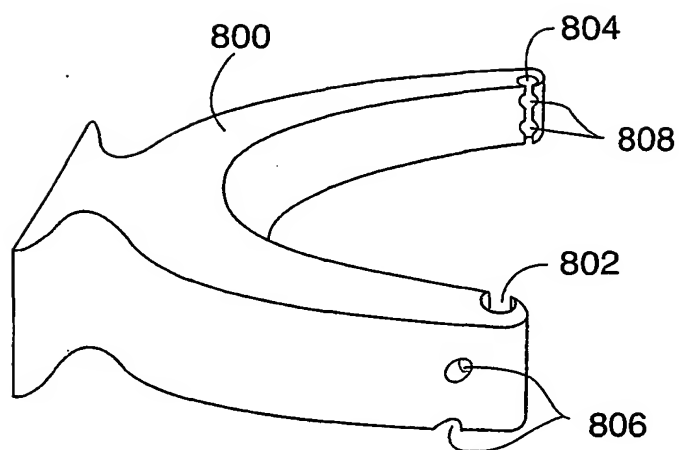
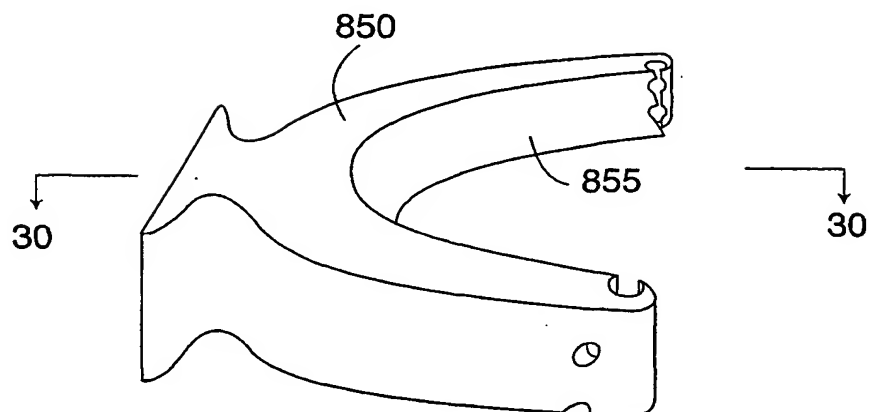
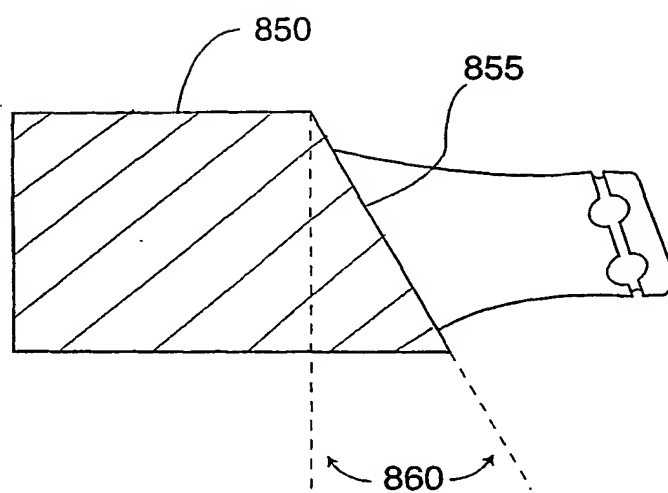


FIG. 29



24 / 24

FIG. 30



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/07956

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :B65B 67/12; B65D 33/00, 33/24

US CL : 248/95; 383/35, 43, 89

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 248/95; 383/35, 43, 88, 89

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2,074,843 A (Hiering) 23 March 1937	
A	US 2,142,764 A (Kluger) 03 January 1939	
A	US 2,142,904 A (Lamarthe) 03 January 1939	
A	US 2,150,627 A (Lieber) 14 March 1939	
A	US 2,822,012 A (Gold) 02 February 1958	
A	US 3,163,193 A (Lamarthe) 29 December 1964	
A	US 3,259,302 A (Rocchisani) 05 July 1966	
A	US 3,345,023 A (Scott et al.) 03 October 1967	
A	US 4,033,013 A (Peterson) 05 July 1977	



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

20 JUNE 2002

Date of mailing of the international search report

11 JUL 2002

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

STEPHEN P. GARBE

Telephone No. (703) 308-1207


Shelia Veney
Paralegal Specialist
Group 3700

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/07956

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.*
A	US 4,317,478 A (Babbidge) 02 March 1982	
A	US 4,593,408 A (Drobish et al.) 03 June 1986	
A	US 5,002,245 A (Hansen et al.) 26 March 1991	
A	US 5,037,138 A (McClintock et al.) 06 August 1991	
A	US 5,609,419 A (Byers, Jr.) 11 March 1997	
A	US 5,743,652 A (Dopps) 29 April 1998	
A	US 5,931,583 A (Collie) 03 August 1999	
A	US 6,022,144 A (Haussein) 08 February 2000	